

***RoadRelay™ 4
User's
Guide***



Table of Contents

1	Introduction.....	4
2	Assumptions.....	4
3	Getting Started	5
4	Using the Keypad.....	5
4.1	Menu Screens.....	6
4.2	Entry Screens.....	7
4.3	Up/Down Entry Screens.....	7
4.4	Data Screens.....	8
4.5	Changing Display Brightness from AUTO LEG.....	8
5	Leg Information.....	8
5.1	Automatic Leg Screens.....	8
5.1.1	Automatic Idle Display.....	9
5.1.2	Heavy Duty Automatic Driving Display.....	10
5.1.3	RV Automatic Driving Display	11
5.1.4	Automatic PTO Display	11
5.2	Manual Leg Screens	12
5.2.1	Manual Driving Display	12
5.2.2	Manual Idle Display	12
5.2.3	Manual PTO Display.....	12
5.2.4	Leg Summary	13
5.2.5	Operating Hours	13
5.3	Resetting Leg Data	14
6	Anti-Theft.....	14
6.1	Selecting the Anti-theft Mode	15
6.2	How to Lock the Engine.....	16
6.2.1	Manual Mode	16
6.2.2	Semi-automatic Mode	17
6.2.3	Automatic Mode.....	17
6.3	How to Unlock the Engine	18
6.4	Changing the Password	19
6.5	Idle Lock	20
7	Driver ID	20
7.1	Turning Driver ID On or Off.....	20
7.2	Choosing a Driver	21
8	Estimated Time of Arrival (ETA)	22
8.1	Changing ETA Arrival Time and Distance	23
8.2	Changing ETA Average Speed.....	23
9	Using the Clock.....	24
9.1	Choosing a 12 or 24-hour Clock	24
9.2	Setting Clock Time.....	24

10	Using the Alarm	24
10.1	Turning the Alarm On or Off	24
10.2	Setting the Alarm Time	25
11	Setting the Date	25
12	Route Recording.....	26
12.1	Starting a New Route.....	26
12.2	Entering the New Route Number	26
12.3	Reviewing Route Records	27
12.4	Printing Route Records	28
12.5	Resetting Route Records	28
12.6	Turning Route Recording On or Off	29
13	Vehicle Monitor	29
13.1	Vehicle Monitor Configuration	33
14	Fault Information.....	34
14.1	Fault Pop-ups	34
14.2	RoadRelay Loss of Power Fault Pop-up.....	35
14.3	Fault Log	36
14.4	Resetting the Fault Log	37
14.5	Printing the Fault Log.....	37
15	Preventative Maintenance	38
15.1	Viewing Preventative Maintenance Schedules	38
15.2	Preventative Maintenance Schedule Setup	39
15.3	Preventative Maintenance Pop-ups	41
15.4	Resetting a Preventative Maintenance Schedule	41
16	Service History Log.....	41
17	Parts Information.....	42
18	Selecting a Language.....	42
19	Units of Measure	43
19.1	Units of Measure - US, UK, Europe, or Metric System	43
19.2	Economy Units	44
19.3	Volume Units	45
20	Configuring for a RV or Heavy Duty Application	45
21	Software Version.....	46
22	Trip Information.....	46
22.1	Resetting Trip Data	50
22.2	Printing a Trip Report	50
23	Driver Messages.....	51
24	Help.....	51

25	Fuel Information.....	54
25.1	State-Line Crossing	54
25.1.1	Recording a State-Line Crossing	55
25.1.2	Recording New State Crossed Into.....	55
25.1.3	Reviewing State-Line Crossing Information	56
25.2	Fuel Purchases.....	56
25.2.1	Recording a Fuel Purchase	56
25.2.2	Recording the Fuel-Purchase State	57
25.2.3	Reviewing Fuel Purchase Information.....	57
25.3	Printing Fuel Tax Records.....	58
25.4	Resetting Fuel Tax Records.....	59
25.5	Acu-trac Fuel Sensor Information	59
26	Setting Transmission Type	59
27	Road Speed Recorder.....	60
28	Pop-ups.....	61
28.1	Coaching Pop-ups	61
28.1.1	Shift Reminder	61
28.1.2	Vehicle Over Speed.....	62
28.1.3	Engine Over RPM.....	64
28.1.4	Other Driver Coaching Pop-ups	65
28.2	Driver Reward Pop-ups.....	65
28.2.1	Driver reward	66
28.3	Aftertreatment Pop-ups	66
28.3.1	Active Regeneration	67
28.3.2	Stationary Regeneration Due Notification.....	69
28.4	Cruise Set-Speed Pop-ups	70
28.5	Other Pop-ups.....	70
28.5.1	Memory Usage Pop-ups	70
28.5.2	RoadRelay	71
28.5.3	Data Link.....	72
28.5.4	Backup Power Connection	72
28.5.5	RoadRelay Loss of Power	73
29	Printing to HyperTerminal	73
30	Environmental Information	74
31	Disconnecting Power for Extended Periods	74
32	Cleaning the RoadRelay 4.....	74
33	Troubleshooting and Technical Support	74
34	Calibration Updates.....	75
35	Warranty.....	76

1 Introduction

The RoadRelay 4 is a vehicle monitoring system that helps drivers perform better and helps owners collect important information about the operation and performance of the vehicle.

Driver benefits include fuel economy feedback information (See "Leg Information" section), estimated time of arrival (See "Estimated Time of Arrival (ETA)" section), a built-in clock with alarm (See "Using the Clock" and "Using the Alarm" sections), driver coaching and driver information pop-ups (See "Pop-ups" section), and many other features.

For protection of the vehicle and the property it is carrying, the anti-theft feature (See "Anti-Theft" section) can be used.

To help service the vehicle, information from the Engine Control Module can be viewed (See "Vehicle Monitor" section). To help troubleshoot vehicle problems fault information is displayed when a fault occurs and then stored for later access by service personnel (See "Fault Information" section). Maintenance is assisted by the use of periodic maintenance pop-ups and stored service information (See "Scheduled Maintenance" and "Service History" sections).

Additionally, if the fleet owner purchases INFORM™ or uses the PowerSpec™ office software, many other types of stored information such as trip data, route data, fuel purchases, and much more can be extracted and presented in easy-to-read reports. RoadRelay 4 configurations and calibrations are changed with the office software.

2 Assumptions

This User's Guide assumes that the RoadRelay 4 has been properly installed (See Installation Guide for installation and troubleshooting information).


The RoadRelay 4 will work with all electronic engines. The examples assume that the engine is a late-model Cummins engine (Celect Plus, ISB, ISC, ISL, ISM, ISX, and Signature 600). Some (very few) screens and features will not be present when the RoadRelay 4 is used with engines other than those listed. Contact your distributor for details.

3 Getting Started













When first using the RoadRelay 4, reading a few sections of this manual will allow you to quickly start using the product. The recommended sections are "Using the Keypad", "Configuring for a RV or Heavy Duty Application", "Selecting a Language", "Using the Clock", and "Units of Measure". Scan the Table of Contents to find other sections that explain features you wish to use.

4 Using the Keypad

Related sections: Leg Information- Automatic Leg Screens






NOTE: All examples will start from an AUTO LEG screen. See the "Leg Information" section to view these screens. To reach an AUTO LEG screen keep pressing  until the screen stays the same.



The RoadRelay 4 has a back-lit keypad which is used to move through the different screens and to enter data. A picture of each key and its name is shown below.

	STEERING WHEEL		UP ARROW
	TRUCK		ROAD
	BACKSPACE		WRENCH
	CONFIGURATION		PAGES
	ENTER		DOWN ARROW
	HELP		FUEL PUMP















Note: The RoadRelay 4 will automatically power down 30 seconds after the key switch is turned off. The RoadRelay 4 may be powered by pressing the ENTER key. As a long as any key is pressed within 30 seconds the RoadRelay 4 will remain powered.




4.1 Menu Screens

Menu screens can be identified by the presence of a SELECTOR (<=) on the right side of the screen. When in a menu, use  and  to move the SELECTOR up or down in a list.  and  will automatically repeat if held down. If you reach the top or bottom of a menu it will "wrap around" to the other end of the menu. To select an item, move the SELECTOR to the right side of the desired item and press .





Example: To see a menu screen, press the  key. The SELECTOR is to the right of the item to be selected. Press  to return to the previous screen.





4.2 Entry Screens


Entry screens can be identified by the presence of a CURSOR (blinking rectangle) on the screen. Use , , , , , , , , , and  to enter numbers. The numbers appear in the upper left-hand corner of the key. When the first key is pressed the old numbers will disappear and the new number will be updated as keys are pressed. When you are finished entering all numbers, press . If you want to undo the last key-press use . If you wish to leave a screen and NOT modify the number, keep pressing  until the screen is gone. *When on an entry screen you may not be able to "jump" between menus, because the key is currently interpreted to be number entry. Use  to exit the screen and normal functioning will return.*

Example: Press ; move the SELECTOR until it is to the right of "Time". Press . You will see the current RoadRelay 4 time and a blinking CURSOR. Press any key with a number on it. The screen will now show the number you have currently selected. Press  several times to discard the change and return to the AUTO LEG screen.

4.3 Up/Down Entry Screens

Some screens use  and  to move through a set of possible choices. The screen changes to show the new choice as  and  are pressed.

Example: Press ; move the SELECTOR until it is to the right of "Time Format". Press . You will see the current time format. Press  and  to see the format switch between 12 and 24-hours.



Press  several times to discard any change and return to the AUTO LEG screen.

4.4 Data Screens

Screens showing data, such as leg or vehicle monitor, will update every second. If data is unavailable or invalid, the screen will have question marks in place of numerical data.

4.5 Changing Display Brightness from AUTO LEG

The RoadRelay 4 has five levels of brightness (including off).

When in an AUTO LEG screen, pressing  will increase the display brightness; pressing  will decrease the brightness. When at the lowest level (off) any key press will turn the display on at the lowest brightness level.


The RoadRelay 4 saves separate brightness settings - one if the headlights are OFF and another if they are ON. If the headlights are OFF you may adjust the setting for headlights being off. If the headlights are ON you may adjust the setting for headlights being on.

5 Leg Information

Related sections: Driver ID, Using the Clock, Estimated Time of Arrival (ETA), Units of Measure, Trip Information, Configuring for a RV or Heavy Duty Application

A "leg" is data collected since the last time the leg information was reset. A leg has less information than a trip. Leg information can not be retrieved using office software - it is only used for driver feedback.

5.1 Automatic Leg Screens

The leg screens are the "top-level" screens. By repetitively pressing  you will eventually reach an AUTO LEG screen. When vehicle operation changes, the screen will automatically change between the AUTO LEG screens. "Heavy Duty" mode has

Idle, Driving, and PTO screens; RV mode has Idle and Driving screens. The change will occur immediately, or after 5 minutes; depending upon whether "Short Stop Mode" is ON or OFF (*Short stop mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software*). All examples in this User's Guide start from an AUTO LEG screen.

5.1.1 Automatic Idle Display

125	3:44 PM
Idle Time:	
4:12 (7%) +++	
Shutdown: 43:22	

OR

125	3:44 PM
Idle Time:	
--12:34 (14%)	
8.2 gal	

The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

The second line identifies this as the idle screen.

The third line shows the amount of time the engine has been idling, the percentage of total leg time the engine has been idling, and performance vs. a 20% goal. Plus (+) and minus (-) symbols indicate performance against this idle-time goal. Therefore, each + or - indicates a 2% difference in actual idle time vs. the goal. A "-" minus indicates too much time is being spent idling; a "+" indicates better performance than the goal. *If the RoadRelay 4 is in "RV Mode" you will not see the feedback for performance vs. idle-time goal. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

The last line will show the remaining time until the engine automatically shuts down, or how much fuel has been used while idling. This is determined by the type of engine and how the engine is set up.

5.1.2 Heavy Duty Automatic Driving Display

125	12:44 PM
ETA: 2:48 PM	0:12
	1234.4 mi
6.7 mpg	+

The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

The second line shows Estimated Time of Arrival (ETA) information. This can be read as: "At your current speed you will arrive at 2:48 PM, which is 12 minutes ahead of when you are scheduled to arrive."

The third line shows the number of miles traveled on this leg.

The last line shows the average leg fuel economy, and performance vs. this average fuel economy. Each + or - indicates a 10% change in the displayed fuel consumption rate. For example, ++ indicates a fuel rate that is currently 20% better (less than) than the rate displayed. *If the RoadRelay 4 is in "RV Mode" you will not see the feedback for performance vs. this average fuel economy. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

5.1.3 RV Automatic Driving Display

125	3:44 PM
Cruise On	722.3 mi
63.5 mph	10.4 mpg
D3 /D3	172 F 168 F

The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.

The second line shows that cruise control is activated and leg distance. If cruise control is off, the cruise status will not be shown.

The third line shows the cruise control set speed and current fuel economy. If cruise control is off, the cruise set speed will not be shown.

The last line shows the transmission gear selected/attained, transmission fluid temperature, and coolant temperature. If the transmission information is not available, it will not be shown.

5.1.4 Automatic PTO Display

This screen will only show up if the Power Take-Off (PTO) is engaged, the vehicle is not moving, and displaying of PTO mode is ON (This is set by INFORM™ or PowerSpec™ office software). *If the RoadRelay 4 is in "RV Mode" you will not be able to access this screen. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.*

125	3:44 PM
PTO Time:	
0:12 (3%)	
3.2 gal	

The top line of the screen shows the current driver ID and the time. If the Driver ID feature is OFF, only time will be displayed.




The second line identifies this as the PTO screen.

The third line shows how long the PTO has been engaged while the vehicle was not moving, and percentage of total leg time the PTO has been engaged with the vehicle not moving.

The last line shows the amount of fuel used while the PTO was engaged and the vehicle was not moving.

5.2 Manual Leg Screens

In addition to Automatic leg screens, you may manually select one of the three engine mode displays (Drive, Idle, and PTO). These screens do NOT automatically switch as the vehicle operation changes; you can use this to always show a particular leg screen.

Manual leg screens are selected by pressing  and then selecting an item from the menu. Use  and  to move between the screens. *If the RoadRelay 4 is powered-down or another menu is selected you will need to return to this menu to restore the manual leg screen.*

5.2.1 Manual Driving Display

Identical to Automatic Driving Display except that this screen is always shown regardless of vehicle operation. See Automatic Driving Display description.

5.2.2 Manual Idle Display

Identical to Automatic Idle Display except that this screen is always shown regardless of vehicle operation. See Automatic Idle Display description.

5.2.3 Manual PTO Display

Identical to Automatic PTO Display except that this screen is always shown regardless of vehicle operation. See Automatic PTO Display description.

5.2.4 Leg Summary

125	Summary
	44.3 mph
	351.6 gal
	83.1 %

The top line of the screen shows the current driver ID and the screen title. If the Driver ID feature is OFF the driver name will be blank.

The second line the shows average speed of the vehicle on this leg.

The third line shows the amount of fuel used on this leg.

The last line shows the average engine load on this leg.

5.2.5 Operating Hours

Operating Hours		
Drive:	6:21	(92%)
Idle:	0:35	(8%)
PTO:	0:00	(0%)





The top line of the screen shows the screen title.

The second line shows the amount of time and percentage of total time spent driving on this leg.

The third line shows the amount of time and percentage of total time spent idling on this leg.

The last line shows the amount of time and percentage of total time spent idling with PTO engaged on this leg.

5.3 Resetting Leg Data

To erase the leg data and start over, hold  for 3 seconds while viewing the leg data. Or, press  and select "Reset Leg" from the menu. Press  to reset, press  to leave this screen and **NOT** reset leg.

Reset Leg?
Yes

6 Anti-Theft

Related sections: Keypad-Entry Screens, Units of Measure

The Anti-theft feature deters vehicle theft by requiring the driver to enter a password, using the RoadRelay 4 keypad, before allowing the engine to start. Anti-theft will work with Cummins Select Plus (revision 4 software and later), ISB, ISC, ISL, ISM, ISX, and Signature 600 engines.

Important Note:

The engine control module determines whether this feature is ON or OFF. ALL Cummins engines leave the factory with Anti-theft turned OFF. Also, the key must be in the ON position in order for the engine to be locked or unlocked.

A customer desiring to use this feature must visit a distributorship or certified dealership and request to have INSITE™ (Cummins authorized service tool) turn the feature to ON (There may be a fee). In addition, while connected, it is VITAL that the customer choose their password or passwords (all numeric) and write them to the ECM at this time. The factory default passwords are all 000000's and can not be changed via the RoadRelay keypad initially. Once changed to some meaningful sequence, the user can work with their selection of password or change via the RoadRelay keypad.






6.1 Selecting the Anti-theft Mode

Anti-theft modes affect how the engine is locked.

The four choices for the anti-theft mode are:

- Off The anti-theft feature is off.
- Manual The driver locks the engine by entering a password.
- Semi-Automatic The driver locks the engine by selecting "Yes" when asked to "Arm Vehicle Security" at key-off.
- Automatic The engine is automatically locked after the ignition key is turned off.

Read "How to Lock the Engine" for more details.

To select the Anti-theft mode press  and select "Security Mode". Use  or  to select the mode you wish to use. Press  to select the mode. Press  to quit. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this setting. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

**Security Mode
Automatic**

The user ***must*** enter the password.

**Enter Password
??????**

If the engine is a Celect Plus and the previous mode was “Off”, the user must confirm the new password.

Confirm Password
??????

If confirmation fails, then the mode is not changed and the following screen is shown:

Vehicle Security
Change Failed

6.2 How to Lock the Engine

How the engine gets locked depends upon the "Anti-theft Mode"(Off, Manual, Semi-automatic, and Automatic). See "Selecting the Anti-theft Mode" for more information.

6.2.1 Manual Mode

At key-off you will see the screen below.

Key On to Arm
Vehicle Security

Turn the key ON. Enter the password on the following screen:

To Arm
Vehicle Security
Enter Password
??????

If the password is correct, you will see this screen and the engine is locked:

**Vehicle Security
Armed**

Otherwise, you must try again.



Password Incorrect

Enter Password
??????

6.2.2 Semi-automatic Mode

At key-off you will see the screen below.

**Key On to Arm
Vehicle Security**

Turn key ON. Press  to lock the vehicle. Press  to leave this screen and NOT lock the engine.


**Arm
Vehicle Security?**

Yes

6.2.3 Automatic Mode

In Automatic Mode the engine automatically locks 30 seconds after the ignition key is turned OFF. If the engine is a CELECT Plus, it will automatically lock 20 seconds after a key-off or stall. This delay prevents the user from having to enter the password for inadvertent key-offs or engine stalls.

6.3 How to Unlock the Engine

If the engine is locked you must enter a six-number password. As the password is entered, each "?" will be replaced with a "*". Press  when you have finished entering 6 numbers.

Vehicle Security
Armed
Enter Password
??????

If the password is correct the following screen will be displayed, and the engine is now unlocked.

Vehicle Security
Disarmed

If the password is incorrect, the following screen will be displayed:

Password Incorrect
Enter Password
??????

If you enter a correct password after an incorrect password, you must confirm the password by entering it again.

Confirm Password
??????


If the units of measure are "US" or "Metric" and you fail to enter the password correctly after five attempts, you will be locked out for 10 minutes. If the units of measure are "UK" or "Europe" and you fail to enter the password correctly after three attempts, you

will be locked out for 30 minutes. When this occurs, the following screen will be shown:

**Password Incorrect
Vehicle Secured**

Note: The ignition key must be ON to allow the lockout timers to operate for the required 10 or 30 minutes.

6.4 Changing the Password

Press . Select "Change Password". *If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this setting. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

**Enter Existing
Password
??????**

Once the existing password has been correctly entered, the new password can be entered on this display:

**Enter New
Password
??????**


You must confirm the new password on the following display. If this fails the password is not changed.

**Confirm Password
??????**

Do not forget your password! When protected by the anti-theft feature, the engine will not start without entering the password. Do not write your password where a thief can find it. Keep it someplace safe where you can find it easily. See the "Warranty" section for important anti-theft warranty information.

6.5 Idle Lock

If the engine is a Cummins ISB, ISC, ISL, ISM, ISX, or Signature 600 it may be locked while idling. If locked while idling it will ignore accelerator pedal changes until unlocked. *Note: This feature is not available if the units of measure are "UK" or "Europe".*


To lock or unlock the engine, press  and select "Lock/Unlock Engine". Refer to the "How to Lock the Engine" section. The unlocking procedure can be seen in the "How to Unlock the Engine" section.

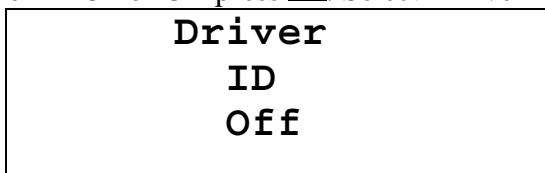
7 Driver ID





Related sections: Using the Keypad

RoadRelay 4 can record separate information for up to four drivers, using the Driver ID function. You can select up to three drivers. In addition, you can select the "Other" driver.

7.1 Turning Driver ID On or Off




To turn Driver ID On or Off press . Select "Driver ID".



Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. *If the RoadRelay 4 is in "Fleet Mode" you will not be able*

to change this setting. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).




7.2 Choosing a Driver



If the Driver ID feature is ON, the following screen will appear at power on OR by pressing , selecting "Driver ID", and pressing . If Driver ID is OFF, the "Driver ID" selection will not appear under the  menu.

When this screen is selected, and when it appears at power-up, 3 beeps will be heard to alert the driver.

The screen will be different if IDs have already been entered.

Select Driver:
Driver (New) - - - - <=
Other


If your ID appears on this screen you may use  or  to select it. Pressing  will accept the selection.

If you need to enter a new driver ID, select "Driver (New)". Press . Enter up to ten numbers to create an ID and press  when finished.

Enter Driver ID:
0000000000

If you pressed       you would see the following:

Enter Driver ID:
123456

Press  and the driver menu will update with a new driver number.

Select Driver:
Driver (New)
123456 - - - - - <=
Other

Note: A driver ID can only be cleared by extracting trip data with the INFORM™ or PowerSpec™ office software or resetting trip data using the “Reset Trip” menu item. This will clear all but the currently selected driver’s ID.

8 Estimated Time of Arrival (ETA)

Related sections: Leg Information-Automatic Leg Screens-Driving Display, Using the Clock, Units of Measure, Configuring for a RV or Heavy Duty Application



If the RoadRelay 4 is in "RV Mode" you will not be able to access this feature. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.

The ETA feature can be used by the driver to quickly show how he or she is doing vs. a scheduled arrival time. ETA information appears on the leg "Driving Screen".






8.1 Changing ETA Arrival Time and Distance

Press . Select "ETA Setup".

**Distance to
Destination:
0 mi**


Use the number keys to enter your travel distance. Press  to accept the new distance and go to the next screen. Use  to quit.

**Scheduled
Delivery
Time:
6:30 PM**



Use the number keys to enter your time. If using a 24-hour clock, press  to finish ETA setup. If using a 12-hour clock, press ; then use  or  to toggle between AM and PM. Press  to finish ETA setup.

8.2 Changing ETA Average Speed

Related sections: Units of Measure

Press . Select "ETA Speed".

**Average ETA
Speed:
42.0 mph**





Use the keys with numbers to enter your speed. Press  to accept the new speed. Use  to quit.

9 Using the Clock

Related sections: Using the Keypad







9.1 Choosing a 12 or 24-hour Clock

Use 12-Hour Clock

To change between a 12 and 24-hour clock, press . Select "Time Format". Use  or  to toggle between 12 and 24-hours. Press  to finish.

9.2 Setting Clock Time

Clock Time:
10:31 PM





To set the clock time press . Select "Time". Use the keys with numbers to enter your time. If using a 24-hour clock, press  to finish. If using a 12-hour clock, press ; then use  or  to toggle between AM and PM. Press  to finish.

10 Using the Alarm

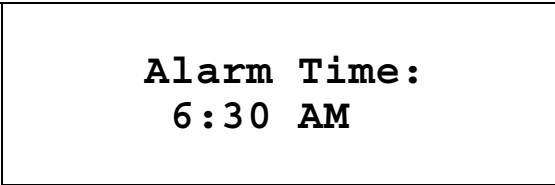
Related sections: Using the Keypad, Using the Clock

10.1 Turning the Alarm On or Off







Alarm:
On

To turn the alarm On or Off press . Select "Alarm Enable". Use  or  to toggle between On and Off. Press  to finish.

10.2 Setting the Alarm Time



Alarm Time:
6:30 AM

To set alarm time press . Select "Alarm Time". Use the keys with numbers to enter your time. If using a 24-hour clock, press  to finish. If using a 12-hour clock, press ; then use  or  to toggle between AM and PM. Press  to finish.

When the alarm goes off, the buzzer will sound and the alarm screen will appear:

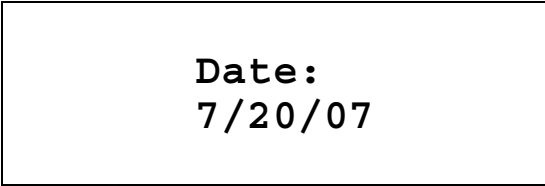


11/21/07 6:30 AM
Alarm!




Press any key to shut off the buzzer. If a key is not pressed the alarm will shut off after 1 minute.

11 Setting the Date

Related sections: Using the Keypad



Date:
7/20/07

To set the date press . Select "Date". Use the keys with numbers to enter the date. Press  to finish. To leave without saving changes, keep pressing .

12 Route Recording

Related sections: Keypad-Entry Screens, Units of Measure, Setting the Clock Time, 12 or 24-Hour Clock Time, Setting the Date, Printing to HyperTerminal, Printers and Printer Cables for RoadRelay 4

A route is the distance and time traveled since the last time a new route was started. This feature is used to create a record for each route. A route does not need to include any travel. It can be used to record time waiting to unload, stuck in traffic, etc.

12.1 Starting a New Route

To start a new route press  and select "Record Route".

Route 1200	
Recorded	
	667.3 mi
10/12/07	12:20 AM

This screen will be shown for 5 seconds. It indicates the previous route number, distance traveled on the previous route, and the time this previous route began.

If this feature is off you will see this screen:

Route Recording Off

12.2 Entering the New Route Number

Please Enter Route Number: 0000
--




When the truck is stopped the screen above will appear asking for the route number.

If the vehicle is moving when a new route is started, this screen will immediately appear if Vehicle-in-Motion Lockout is OFF (*Vehicle-in-Motion Lockout can only be turned ON or OFF using INFORM™ or PowerSpec™ office software*). A passenger may enter the new route number; for safety reasons *the driver should never enter data while driving*. If Vehicle-in-Motion Lockout is ON this screen will wait to appear until 5 minutes have passed while idling, or a key on the RoadRelay 4 is pressed while idling.


If you leave without entering a route number, route numbers will be asked for when another route is started, at key-off, and at key-on.

If the entered route number matches a previously entered route number, the user will be asked if this is a new route (as opposed to continuing the present route).




<p>Start New Route? Yes</p>

Use  or  to toggle between Yes and No. Press  to finish.

12.3 Reviewing Route Records

To review the route information saved in the RoadRelay 4 press . Select "Review Routes".




Route 1200	12/20/07
Drive	22:12
Idle	2:34
1084.5 mi	157.2 gal

Use  and  to review the routes. To leave, press . The route information shown is the sum of all records in a route. The top line shows the route number and date when the route started.


The second and third lines show the amount of time spent driving and idling. The last line shows the total distance and fuel used on the indicated route.

12.4 Printing Route Records



Print Route Log?
Yes

Connect the RoadRelay 4 to your PC serial port and by utilizing the HyperTerminal PC utility provided by the Windows™ operating systems, you can output RoadRelay screen information to the PC (refer to Printing to HyperTerminal section of this manual). To start data streaming from the serial port, press . Select "Print Routes". Press  to print. To leave, press . The printed report will have a header section with the report title, time of printing, engine serial number, and odometer reading. It will then show all Route information, with each route separated by a line of asterisks (*).


12.5 Resetting Route Records

Press ; select "Reset Routes".





Reset Route?
Yes

This reset will erase all route information. Press  to reset, press  to leave this screen and NOT clear the route log. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to reset the information. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

12.6 Turning Route Recording On or Off

Press . Select "Route Enable".




**Route Enable
On**

Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this setting. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

13 Vehicle Monitor

Related sections: Units of Measure, Vehicle Monitor configuration

The vehicle monitor shows data currently being received by the RoadRelay 4 from the data link.

Press . Select "Vehicle Monitor". Use  and  to move between the screens. Note that your screens may not show all the data – if the information is not available, question marks may be shown or the entire line may be blank.

1850 rpm	19.0 psi
38.3 %	13.2 V
55.7 mph	35.0 psi
	181.3 F

This screen is the Configurable Vehicle Monitor screen. Refer to the Vehicle Monitor Configuration section for instructions on customizing this screen. The default screen setting is shown above. Holding the Enter key down for 5 seconds will reset this screen to factory defaults.

Engine RPM and boost pressure are on the first line.
 Percent engine load and battery voltage are on the second line.
 Road speed and oil pressure are displayed on the third line
 Engine coolant temperature is displayed on the last line.

RPM	1850.0 rpm
Boost Pres	32.3 psi
Load	38.3 %
Inst Econ	8.2 mpg

This screen shows engine RPM, boost pressure, current engine load, and instantaneous fuel economy.

Cool Temp	130.0 F
Oil Pres	82.5 psi
Oil Temp	110.0 F
Battery	???.? V

This screen shows coolant temperature, oil pressure, oil temperature, and battery voltage. *In this example, the battery voltage is not available from the vehicle and therefore is shown as question marks.*

Road Speed	70.0 mph
Fuel Rate	17.08 gph
Air Pres	30.1 "Hg
Air Temp	110.0 F

This screen shows road speed, fuel rate, outside air pressure, and outside air temperature.

Transmission	
Gear Actual	9
Gear Requested	10
Trans Fluid	105.7 F

This screen shows the gears selected and requested. The bottom line shows the temperature of the transmission fluid. *This screen*

can only be seen on trucks with automatic transmissions which send this information to the RoadRelay 4. The gear values are sent by the transmission and the displayed gears will vary by transmission manufacturer.

DRIVER REWARD STATUS		
Reward Level	2	
RoadSpd Gov	68	mph
Cruise Limit	72	mph

This screen shows the current driver reward level, road speed governor limit, and cruise control limit. *This screen can only be seen on trucks with the Driver Reward feature on.*

ECM	132356.2	mi
RR4	132102.7	mi
RR4	22390.17	gal
RR4	3308:52	hrs

This screen shows the accumulated totals for distance traveled, fuel used, and hours of operation. "ECM" in the first column indicates the total is from the engine control module. "RR4" indicates the total is from the RoadRelay 4. If the ECM data is not available, this data will not be shown.

Aftertreatment		
DPF Outlet	725.0	F
AFT1	278.9	gal
Status:	Due NOW	

This screen displays information and status of the Cummins Aftertreatment System.

The second line shows the Diesel Particulate Filter (DPF) temperature.

The third line shows the lifetime fuel used by the aftertreatment system.

The fourth line shows the current status of the Aftertreatment system. The valid aftertreatment status conditions are defined in the table below:





Status	Status Condition
<blank>	No regeneration activity
Status: Soon	Stationary (Parked) regeneration is due soon
Status: Due NOW	Stationary (Parked) regeneration is due now
Status: Active	The aftertreatment system is performing an Active regeneration.
Status: Passive	The aftertreatment system is performing a Passive regeneration.
Halted by Clutch	An Active regeneration has been halted by the clutch.
Halted Service Brake	An Active regeneration has been halted by the service brake.
Halted by PTO	An Active regeneration has been halted by PTO.
Halted by Throttle	An Active regeneration has been halted by the throttle.
Halted Not Neutral	An Active regeneration has been halted by the vehicle not being in neutral.

This screen can only be seen on vehicles equipped with the Cummins EPA 2007 Aftertreatment System. Reference your Cummins Owners Manual for complete details on your vehicle's aftertreatment system.












13.1 Vehicle Monitor Configuration

The Vehicle Monitor Summary screen can be customized to display up to eight vehicle monitor parameters. The default settings are defined in the Vehicle Monitor section of this manual.

VM 1	RPM	-----	<=
VM 2	Engine Load		
VM 3	Road Speed		
VM 4	Leave Blank		
VM 5	Boost Pres		
VM 6	Battery Volts		
VM 7	Oil Pressure		
VM 8	Coolant temp		

To customize the Vehicle Monitor Summary screen for your vehicle, press , use  or  to scroll to VMonitor Config, then press  to select. This screen displays the current (default) settings of the Vehicle Monitor Summary screen. The Vehicle Monitor Summary screen is divided into eight fields. Fields 1 through 4 will be displayed on the left of the Vehicle Monitor Summary screen and fields 5 through 8 will be displayed on the right side of the Vehicle Monitor Summary screen. The default parameter for each field is shown above.

For example, the steps necessary to change the parameter currently defined in field 5 “Boost Pres” to “Fuel Rate” are outlined below. Note that field 5 is displayed in upper right-hand corner of the Vehicle Monitor Summary screen.

Use  to move to VM 5 Boost Press. Press  to select this field. Use  and  to move between the list of available parameters for your vehicle. Move the cursor to the “Fuel Rate” parameter. Press  to select this parameter. Now to verify the results of the change, press ; use  or  to move to "Vehicle Monitor". Press  to select Vehicle Monitor. Use  or  to

move to the Vehicle Monitor Summary Screen. Notice that field 5 (upper right-hand corner of screen) now displays the Fuel Rate.

1850 rpm	1.35 gph
38.3 %	13.2 V
55.7 mph	35.0 psi
	181.3 F

Additional notes:

1. Vehicle Monitor configuration can only be changed while the ignition switch is in the ON or RUNNING position.
2. Your list of parameters may be different from those of other vehicles. The RoadRelay will only display those parameters available for *your* particular vehicle.
3. The list of parameters also contains a “Leave Blank” and a “Reset To Default” option. The Leave Blank option will not display any information in the field. The Reset To Default option will reset the field to the default parameter assigned by the factory.
4. Refer to the Vehicle Monitor Section for instructions on resetting the entire Vehicle Monitor Summary screen to factory defaults.

14 Fault Information

Related sections: Printing to HyperTerminal, Printers and Printer Cables for RoadRelay 4

14.1 Fault Pop-ups

When a fault occurs for the first time a pop-up will occur warning the driver that a fault condition exists. Reminders for an active fault will then pop-up every 24 hours.

Example fault pop-ups:

If the engine is a late-model Cummins engine it will contain fault information and advice on the seriousness of the fault.

**Water in Fuel
Circuit Failure:
Service Soon.**

If the engine is not a late-model Cummins the following would be shown:

**Engine Controller
Water in Fuel indic.
Voltage > Normal**

14.2 RoadRelay Loss of Power Fault Pop-up

The following fault occurs when the RoadRelay has experienced a power interruption (initial RoadRelay 4 installation, battery removed from vehicle, cab power disconnected, etc.). This fault serves two purposes. First, it serves as a reminder to set the RoadRelay clock. Second, if it continues to pop-up after vehicle power interruptions, it signifies that the RoadRelay internal back-up battery is dead (flat). Follow the procedure below to determine a properly functioning back-up battery:

Note: Data may be lost while performing this procedure. Verify that data is extracted and/or backed-up before continuing.

1. Install the RoadRelay as outlined in the RoadRelay 4 Installation Manual. Verify the loop-back connector (P/N 4003226) is installed.
2. Set the time of day using the RoadRelay 4 clock (refer to “Setting the Clock Time” section in this manual).
3. Remove power from the vehicle (disconnect vehicle battery or disconnect RR4 power harness) for a least 10 seconds.
4. Re-connect vehicle power.

5. Verify that the RoadRelay 4 retained the time of day as set in step #2.


If the time of day is retained, the back-up battery is functioning properly. Refer to “Resetting the Fault Log” section of this manual to reset the Loss of Power fault.

If the time of day is reset to 12:00 AM (time will be flashing), then the internal back-up battery is dead (flat). The RoadRelay will continue to collect and monitor vehicle information, but data will be lost in situations where vehicle (battery) power is removed from the RoadRelay 4 (such as removing the battery from vehicle, disconnecting power to the cab/dashboard, servicing the vehicle, during accidents, etc). The RoadRelay back-up battery is not a customer replaceable part.



**RoadRelay
Loss of Power
Set RoadRelay Clock**

Note that this fault will be displayed in the Fault Table as PID 168 RoadRelay; Loss of Power; Set RoadRelay Clock. Refer to the Fault Log section for instructions on viewing the Fault Table.

14.3 Fault Log

To view fault information press , and select "Fault Table". If no faults have been received you will see:

**No Faults
Recorded**

Otherwise, faults will be listed in the order they occurred, last seen first. Use  and  to move between the screens. Fault code

information is provided to help service personnel trouble-shoot problems. The fault log will contain a short description of each fault.

Example fault log screens:




If the engine is a late-model Cummins engine it will contain a fault code and advice on the seriousness of the fault.

**Code 428 Active 1
Water in Fuel
Circuit Failure:
Service Soon.**

If the engine is not a late-model Cummins the following will be shown:

**PID 97 Active 1
Engine Controller
Water in Fuel indic.
Voltage > Normal**


14.4 Resetting the Fault Log



To clear all inactive faults, press  and select "Reset Faults". Press  to reset, press  to leave this screen and NOT reset faults.

**Reset Faults?
Yes**

14.5 Printing the Fault Log

**Print Faults?
Yes**

Connect the RoadRelay 4 to your PC serial port and by utilizing the HyperTerminal PC utility provided by the Windows™ operating systems, you can output RoadRelay screen information to the PC (refer to Printing to HyperTerminal section of this manual). To start data streaming from the serial port, press .




Select "Print Faults". Press  to print. To leave, press . The printed report will have a header section with the report title, time of printing, engine serial number, and odometer reading. It will also show all faults with each separated by a line of asterisks (*).

15 Preventative Maintenance

Related sections: Service History

Preventative Maintenance is used to indicate when it is time to perform scheduled maintenance.

15.1 Viewing Preventative Maintenance Schedules


To view the Preventative Maintenance schedules press . Select "PM Schedules". There are four schedules. Use  or  to move between the schedules.

PM Schedule 1		*
Oil Change		
5000	of	
6000	mi	





The screen summarizes the schedule information. The first line indicates this is schedule 1. An asterisk (*) at the end of the line indicates that the pop-up is on; no asterisk would indicate the popup is off. The second line shows the schedule title (oil change). The next two lines show that oil is changed every 6000 miles, and 5000 miles have been driven since the last oil change. If the display shows "5000 to go", instead of "5000 of", there are 5000 miles until the next oil change is due.

15.2 Preventative Maintenance Schedule Setup




Preventative maintenance schedules are used to alert the driver that it is time to have the vehicle serviced. The RoadRelay 4 has four maintenance schedules. A maintenance schedule has settings for pop-up on/off, title, duration, base count, and count direction. The schedules may also be entered using INFORM™ or PowerSpec™ office software.

To setup a maintenance schedule press , select “Prev Maint Config”.




```
PM1 (Oil Change ) <=  
PM2 (Tire Change )  
PM3 (Brake Change)  
PM4 (Fuel Filter )
```

Use  or  to select the schedule you would like to change.
Press  to continue. Press  to leave the screen.

```
Maintenance Schedule  
  Popup  
    On
```







Use  or  to turn the pop-up on or off. Press  to continue.

```
Select Title:  
  
Tire Change
```

Use  or  to see all of the pre-loaded maintenance titles. Press  to select the item. If none of the pre-loaded titles are appropriate you may create your own by selecting “Custom”. This will put the RoadRelay 4 into a special entry mode for entering a









title. You must fill one line with letters and spaces to finish the title.

<p>Enter Title:</p> <p>Grease Ax1_</p>
--

Use  and  to move through the different letters and numbers. If the arrow keys are held down they will repeat. To change from lower case to upper case or vice versa, press . To get variants of letters (such as ‘e’ to ‘è’ or ‘n’ to ‘ñ’) press  until the correct variant is found. Special characters (%, -, etc.) are variants of spaces. Press  to move to the next letter in the line. Press  to move backwards. You must fill one line with letters and spaces to finish the title.

Next the interval information is selected.

<p>Interval</p> <p>Type: Distance</p> <p>Range: 30000 mi</p> <p>Count: Up</p>

The cursor starts on the “Type” line. Use  and  to move through the different types of intervals. Press  to make a selection. Next, use the numbered keys to enter a range. Press  when finished. Finally, use  and  to select between counting up or down on the “PM Schedules” displayed under the  key. Press  to finish.








If a maintenance schedule is already running, the title and count direction may be changed without resetting the elapsed count. Changing the maintenance interval type and range will reset the schedule.

15.3 Preventative Maintenance Pop-ups

When a schedule reaches 90% (and every 5% of schedule thereafter) a Preventative Maintenance Pop-up will occur to warn the operator that it is time to schedule maintenance.

PM Schedule 2		*
Oil Change		
18000	of	
20000	mi	


15.4 Resetting a Preventative Maintenance Schedule

To reset a Preventative Maintenance schedule press . Select "PM Schedules". There are four schedules. Use  or  to move to the schedule to be reset. Press and hold  until you hear a "beep" from the RoadRelay 4. Or, press , select "Reset PM Schedules", Select PM1, 2, 3, or 4. Press  to reset, press  to leave this screen and NOT reset the maintenance schedule.



Reset PM?
Yes

Resetting the schedule will cause it to restart and create an entry in the Service History Log.

16 Service History Log

To view the Service History records, press . Select "Service History".


Engine Oil		
7/05/07	123010	mi
Fuel Filter		
3/22/07	81729	mi

There can be up to 6 entries (2 per screen). Use  or  to move between the screens. Each record indicates the item serviced, date of service, and odometer reading when serviced. The odometer reading will be from the engine, if available; otherwise, it will be the RoadRelay 4 odometer reading.

No Service History Record

If no service history records are in the log, this screen will be shown.

17 Parts Information

If your vehicle has a Cummins engine, the following screen can be seen by pressing , and selecting "Parts Information".





**For Engine Parts
Information Call:
1-800-DIESELS
Engine SN: 12345678**

The last line shows the engine serial number.

18 Selecting a Language


Related sections: Using the Keypad

**Language: English <=
Idioma: Espanol
Langue: Francais
Idioma: Português
Lingua: Italiano
Kieli: Suomi**


The RoadRelay 4 provides six languages: English, French, Spanish, Portuguese, Italian, and Finnish. To change the language press . Select the language you prefer. After you press  you will be in the "Help" screens. Press  to review these screens. To leave, press .

19 Units of Measure

Related sections: Using the Keypad

The RoadRelay 4 allows the user to select the measurement system desired. Press  to reach the menu items for selecting units of measure. Most units can be changed to US, UK, or metric under the "Units" selection. Economy (mpg, mpG, kpl, and lpk) and volume (gallons, imperial gallons, and liters) must be selected separately because of the greater number of choices.

19.1 Units of Measure - US, UK, Europe, or Metric System

Press , select "Units". Select desired choice.

If the RoadRelay 4 is in "Fleet Mode" you will not be able to change the units of measure. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).

Units:	US	--	<=
	UK		
	Europe		
	Metric		

US units are miles (mi), miles per hour (mph), degrees Fahrenheit (F), and pounds per square inch (psi). US date format is month/day/year. The volume unit is gallons (gal). The economy unit is miles per gallon (mpg). The fuel rate is gallons per hour (gph). Units for barometric pressure are inches of Mercury ("Hg). The clock is in 12-hour format.

UK units are miles (mi), miles per hour (mph), metric horsepower (PS), degrees Celsius (C), and kilopascals (kPa). UK date format is day/month/year. The volume unit is imperial gallons (Gal). The economy unit is miles per gallon (mpG). The fuel rate is imperial gallons per hour (Gph). Units for barometric pressure is millibars (mb). The clock is in 24-hour format.

Europe units are kilometers (km), kilometers per hour (kph), metric horsepower (PS), degrees Celsius (C), and kilopascals (kPa). Europe date format is day/month/year. The volume unit is liters (lit). The economy unit is kilometers per liter (kpl). The fuel rate is liters per hour (lph). Units for barometric pressure are inches of Mercury ("Hg). The clock is in 24-hour format.

Metric units are kilometers (km), kilometers per hour (kph), metric horsepower (PS), degrees Celsius (C), and kilopascals (kPa). Metric date format is day/month/year. The volume unit is liters (lit). The economy unit is kilometers per liter (kpl). The fuel rate is liters per hour (lph). Units for barometric pressure are inches of Mercury ("Hg). The clock is in 12-hour format.

19.2 Economy Units

Press ; select "Economy Units". Select desired choice.

Economy:	mpg	<=
	mpG	
	kpl	
	Lp100k	

Choices are miles per gallon (mpg), miles per Imperial gallon (mpG), kilometers per liter (kpl), and liters per 100 kilometers (lpk).

19.3 Volume Units

Press ; select "Volume Units". Select desired choice.

Volume:	Gallons	<=
	Liters	
	Imperial Gallons	

20 Configuring for a RV or Heavy Duty Application

Related sections: Estimated Time of Arrival (ETA), Mark and Go To, Driver Messages, Leg Information

Press ; select "Vehicle Setup". Select desired choice.


Vehicle Setup:
Heavy Duty -- <=
RV

Vehicle Setup shall define the RR4 feature functionality based upon the vehicle's primary use: Heavy-Duty or RV.

When RV mode is selected, the following features will be unavailable:

1. ETA
2. Driver Messages
3. Average vs. Instantaneous Fuel economy feedback on leg driving screen
4. Idle Display Fleet Goal percent feedback on leg idle screen
5. PTO Mode screen under leg
6. Manual State Line Crossing
7. Trip – PTO, Coast, Idle Shutdown, and Driver Reward screens not shown

21 Software Version

Press ; select "Software Version".


<p>Software Version 4.2L00B 4.6L01E</p>
--




The information on this screen may be useful if making a call to Cummins for support.

22 Trip Information

Related sections: Driver ID, Leg Information, Printing to HyperTerminal, Printers and Printer Cables for RoadRelay 4, Configuring for a RV or Heavy Duty Application

A "trip" is data collected since the last time the trip information was reset. A trip has more information than a leg. Trip information can be retrieved using INFORM™ or PowerSpec™ office software.

To see trip information press , select "Trip Information". Trip information shall be displayed for the driver currently selected.

Use  or  to move between the screens. To leave, press .

<p>Trip Information 125 1252.1 mi 6.81 mpg</p>
--

<p>110:23 hrs 644.5 gal 44.8 mph 23.9 %</p>

This screen shows the time, fuel, average speed and average engine load.

Operating Hours		
Drive:	55:25	(51%)
Idle:	54:58	(49%)
PTO:	0:00	(0%)

PTO information will not be shown if the RoadRelay 4 is in "RV Mode".

Operating Fuel gal		
Drive:	40.3	(78%)
Idle:	5.1	(22%)
PTO:	0.0	(0%)

PTO information will not be shown if the RoadRelay 4 is in "RV Mode".

SAFETY		
Coast Out of Gear	3	
Panic Stops	2	
Service Brakes	17	

OVERSPEED 1		
12:25	(12%)	hrs
133.2		mi
20.3		gal

OVERSPEED 2		
10:49	(9%)	hrs
123.4		mi
19.5		gal

SWEET SPOT		
15:25	(17%)	hrs
923.2	mi	
20.3	gal	

This screen will not be shown if the RoadRelay 4 is in "RV Mode".

MAXIMUM VALUES		
2890	rpm @	12.0 mph
74.0	mph @	2430 rpm

COAST		
0:25	(2%)	hrs
23.2	mi	
7.3	gal	

This screen will not be shown if the RoadRelay 4 is in "RV Mode".

ENGINE WEAR		
Hot Shutdowns:		2
Warm-up Wear:		0
Derate Time:		0:00

IDLE SHUTDOWNS		
Shutdowns:		2
Overrides:		14

This screen will not be shown if the RoadRelay 4 is in "RV Mode".

ROAD SPEED GOVERNOR

5:25 (2%) hrs

193.2 mi

20.3 gal

CRUISE CONTROL

5:25 (2%) hrs

923.2 mi

25.3 gal

TOP GEAR

15:25 (22%) hrs

923.2 mi

29.3 gal

NEXT GEAR DOWN

9:25 (12%) hrs

923.2 mi

13.7 gal

ENGINE BRAKES

1:05 (2%) hrs

12.2 mi

Number: 1123

SERVICE BRAKES

0:45 (2%) hrs

3.2 mi

Number: 523



DRIVER REWARD
11:25 (12%) hrs
823.2 mi
14.3 gal

This screen will not be shown if the RoadRelay 4 is in "RV Mode".

22.1 Resetting Trip Data




Press and hold  while looking at a trip screen until the RoadRelay 4 beeps. Or, press ; select "Reset Trip".

Reset Trip? Yes

Press  to reset, press  to leave this screen and NOT reset trip. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to reset the data. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

22.2 Printing a Trip Report

Print Trip Report? Yes

Connect the RoadRelay 4 to your PC serial port and by utilizing the HyperTerminal PC utility provided by the Windows™ operating systems, you can output RoadRelay screen information to the PC (refer to Printing to HyperTerminal section of this manual). To start data streaming from the serial port, press . Select "Print Trip". Press  to print. To leave, press . The printed report will have a header section with the report title, time of printing, engine serial number, and odometer reading.

It will show all trip-information screens, each separated by a line of asterisks (*).


23 Driver Messages

Related sections: Configuring for a RV or Heavy Duty Application

If the RoadRelay 4 is in "RV Mode" you will not be able to access this feature. RV or Heavy Duty mode can be selected by using the "Vehicle Setup" configuration.

Driver messages are entered into the RoadRelay 4 using INFORM™ or PowerSpec™ office software.






If an unread driver message is in the RoadRelay 4 the word "Message" will blink in the upper left-hand corner of the auto-leg screens, alternating with the driver ID if one is shown.

To see the messages press  and select "Driver Messages".

**No Driver
Messages**

If there are no messages you will see this screen.

24 Help

Press . Select the language you prefer. After pressing  the first "Help" screen will be shown. Use  and  to review these screens. To leave, press .

Language: English <=
Idioma: Espanol
Langue: Francais
Idioma: Português
Lingua: Italiano
Kieli: Suomi

ROADRELAY HELP
Press the Down
Arrow to review help
topics.

Steering Wheel (0)
Driver ID, ETA and
Vehicle Security.

Up Arrow (1)
Menu control, data
selection, and
brightness control.

Truck Key (2)
Leg data menu.
Reset leg by holding
the Enter key.

Road Key (3)
Records route data.

Backspace Key
Backs out of screens
or corrects data
entry mistakes.

Wrench Key (4)
Aids in service and
maintenance of the
vehicle.

Configuration (5)
Configures the
RoadRelay

Pages (6)
Displays trip
information and
driver messages.

Enter/Reset
Accepts data entry.
Hold three seconds
to reset.

Down Arrow (7)
Menu control, data
selection, and
brightness control.

Question Mark (8)
Accesses help
information.

**Fuel Pump (9)
Records data by
state.**

**Numeric Entry
The numbers on the
keys are used for
numeric entry.**

**For More
Information
Call
1-800-433-9341**

25 Fuel Information

Related sections: Using the Keypad, Printing to HyperTerminal, Printers and Printer Cables for RoadRelay 4, Units of Measure, Configuring for a RV or Heavy Duty Application




A manual state-line-crossing feature is present in the RoadRelay 4. It can also save fuel purchase information. This information can be used to help with fuel tax records.

25.1 State-Line Crossing

This feature is used to record state-line crossings.

Note: This feature is not available if the units of measure are "UK" or "Europe" or if the RoadRelay 4 is in "RV Mode".

25.1.1 Recording a State-Line Crossing

When you cross a state line, you must press . If you are moving, a screen, as shown below, will appear with the distance traveled since the last time  was pressed. If you are not moving you may record a state-line crossing by pressing , and then selecting "State Line Cross". This same screen will appear.


**State Line
Crossing**

267.3 mi




Odom: 101303.6 mi

25.1.2 Recording New State Crossed Into





Indiana to:
Indiana ----- <=
Illinois
Kentucky
Michigan
Ohio
Alabama

If the truck is moving when  is pressed, this screen will immediately appear if Vehicle-in-Motion Lockout is OFF (*Vehicle-in-Motion Lockout can only be turned ON or OFF using INFORM™ or PowerSpec™ office software*). A passenger may enter the new state; *the driver should never enter data while driving*. If Vehicle-in-Motion Lockout is ON this screen will not appear until 5 minutes have passed while idling, or a key on the RoadRelay 4 is pressed while idling. The screen will also appear at key-off.

If you do not select a jurisdiction at power-down, you will not be asked to enter it again and it will be marked as "Unknown" in the records!

The first line will show the state you are leaving. Use  and  to move through the list of states, provinces, territories and Mexico. The list has the current state first, followed by all the states next to this state. A full list of all states follows these. Press  when you have selected the state you want.

25.1.3 Reviewing State-Line Crossing Information

To review state-line crossing information press , select "Review Crossings". Use  and  to review these screens. To leave, press .


Fuel by State	1
Indiana	
	164.6 mi
Odom:	165303.6 mi

The top line indicates this is a review of fuel used by state and the record number. The oldest records have the lowest numbers. The second line shows the jurisdiction for which the data was collected. The third line shows the distance traveled in the jurisdiction. The last line shows the odometer value at the time of the crossing.


25.2 Fuel Purchases

This feature is used to record fuel purchases.

25.2.1 Recording a Fuel Purchase

Press , select "Fuel Purchase".




10/12/07	12:20 AM
Fuel Purchased:	
	000.0 gal

Use the keys with numbers to enter the amount of fuel purchased.
Press  to finish.

25.2.2 Recording the Fuel-Purchase State

You will then be asked to enter the state in which you purchased the fuel.





Fuel Purchase In:
Indiana ----- <=
Illinois
Kentucky
Michigan
Ohio
Alabama

Use  and  to move through the list of states, provinces, territories and Mexico. The list has the current state first followed by all the states next to this state. A full list of states follows these. Press  when you have selected the state you want.

If you leave this screen without entering anything, it will be marked as "Unknown" in the records!

Note: This menu will not appear if the units of measure are "UK" or "Europe".

25.2.3 Reviewing Fuel Purchase Information




To review fuel purchase information press , select "Review Purchases". Use  and  to review these screens. To leave, press .

Fuel Purchase	1
Indiana	
	58.4 gal
11/23/07	11:12 PM

The top line indicates this is a review of fuel purchases and the record number. The oldest records have the lowest numbers. The second line shows the jurisdiction for which the data was collected. The third line shows the amount of fuel purchased in the jurisdiction. The last line shows the time of the purchase.

25.3 Printing Fuel Tax Records





Connect the RoadRelay 4 to your PC serial port and by utilizing the HyperTerminal PC utility provided by the Windows™ operating systems, you can output RoadRelay screen information to the PC (refer to Printing to HyperTerminal section of this manual). To start data streaming from the serial port, press . Select "Print Fuel Log". Press  to print. To leave, press . The printed report will have a header section with the report title, time of printing, engine serial number, and odometer reading. It will then show all state-line crossing information and fuel purchases, each separated by a line of asterisks (*).


25.4 Resetting Fuel Tax Records

Press ; select "Reset Fuel Log".

**Reset
Fuel Log?
Yes**

This reset will erase all state-line crossing and fuel purchase information. Press  to reset, press  to leave this screen and NOT clear the fuel log. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to reset the information. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

25.5 Acu-trac Fuel Sensor Information






The sensor information is only available if the vehicle is equipped with this device. To view the Acu-trak information press . Select "Fuel Sensor Data".

Fuel Sensor		
Level	41.8%	83 gal
Economy	6.92	mpg
Range	574.4	mi




26 Setting Transmission Type




Related sections: Coaching Pop-ups

This setting does not affect the transmission in any way; it tells the RoadRelay 4 what type of transmission is present. It also prevents coaching pop-ups for automatic transmissions. For TOP-2 transmissions it prevents pop-ups while in the top 2 gears.

To select a transmission type press . Select "Transmission". Use  or  to select "Manual", "Top-2", or "Automatic". Press  to finish. To leave without saving changes, press .

27 Road Speed Recorder

This feature is for the recording of data after a vehicle incident. An incident can be defined as any situation where a 75 second recording of road speed, engine speed, brake activity and clutch activity may be of value to the driver or end user. To record the road speed, engine speed, brake activity, and clutch activity press and hold the Truck key ( or ) and  key together, for three seconds.

The following screen will appear asking if you really want to record the information. Use  or  to select Yes or No. Press  to finish.

**Save
Road Speed Report?

Yes**

If you select "Yes", the previous 60 seconds and the next 15 seconds of information are stored while moving. If you are stopped, the 60 seconds before stopping and 15 seconds after stopping are stored. You will see the following screen and hear a siren-like sound while the information is stored. The information can only be seen using INFORM™ or PowerSpec™ office software.

**Recording Last
60 Seconds of
Road Speed
11/26/07 6:22 PM**

28 Pop-ups

Pop-ups are seen when the driver may need to be warned of certain events.

28.1 Coaching Pop-ups


Related sections: Setting Transmission Type

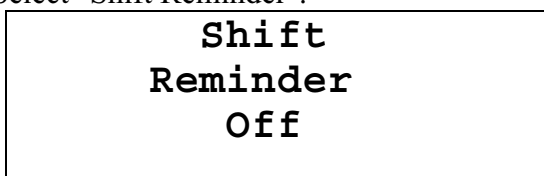
Coaching pop-ups are used to help the driver operate the vehicle in a more economical and safer manner.





28.1.1 Shift Reminder

All engines have a RPM zone in which it gets the best fuel economy. Shift reminder can be used to remind the driver that it is time to shift up or down to remain in this range.

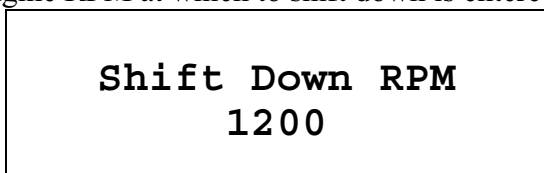
28.1.1.1 Setting up Shift Reminder



Press . Select "Shift Reminder".





Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. *If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this coaching pop-up setup. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

Next, the engine RPM at which to shift down is entered.



Use the keys with numbers to enter the desired shift-down RPM. Press  to save the selection. Press  to leave this screen and NOT update the shift reminder RPM.

Shift Up RPM
1700

Use the keys with numbers to enter the desired shift-up RPM. Press  to save the selection. Press  to leave this screen and NOT update the shift reminder RPM.

28.1.1.2 Shift Reminder Pop-ups

After the shift reminder has been enabled and engine RPM has been entered, the following pop-ups may occur.

Shift Up
To Improve
Fuel Economy

This pop-up appears when the engine is operating above the shift-up RPM. Staying below this RPM improves fuel economy.

Shift Down
To Improve
Fuel Economy

This pop-up appears when the engine is operating below the shift-down RPM. Staying above this RPM improves fuel economy.





28.1.2 Vehicle Over Speed

Vehicle over speed is used to warn the driver when the vehicle is moving too fast. Driving too fast may be an unsafe condition.



28.1.2.1 Setting Up Vehicle Over Speed

Press . Select "Over Speed".



**Over Speed
Indicator
Off**

Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. *Turning the pop-up off does NOT prevent an over speed occurrence from being recorded in trip data. If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this coaching pop-up setup. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

**Over Speed 1
Threshold
62 mph**

Over speed 1 is the speed at which the warning pop-up occurs. Use the keys with numbers to enter the desired speed. Press  to save the selection. Press  to leave this screen and NOT update the speed.

**Over Speed 2
Threshold
65 mph**

No pop-up occurs when this speed is reached. The time spent above this speed is part of the recorded trip information. Use the keys with numbers to enter the desired speed. Press  to save the selection. Press  to leave this screen and NOT update the speed.

28.1.2.2 Vehicle Over Speed Pop-up

Press . Select "Over RPM".

**Vehicle Speed
Over 62 MPH**

This pop-up appears when the vehicle is moving faster than the over speed 1 setting.





28.1.3 Engine Over RPM

Engine over RPM is used to warn the driver when the engine is being run too fast. Over-revving the engine may damage it.

28.1.3.1 Setting Up Engine Over RPM

Press . Select "Over RPM".

**Over RPM
Indicator
Off**

Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice. *Turning the pop-up off does NOT prevent an over RPM occurrence from being recorded in trip data. If the RoadRelay 4 is in "Fleet Mode" you will not be able to change this coaching pop-up setup. (Fleet mode can only be turned ON or OFF using INFORM™ or PowerSpec™ office software).*

**Over RPM
2400**

The entered number is the RPM at which the warning pop-up occurs. Use the keys with numbers to enter the desired speed. Press

 to save the selection. Press  to leave this screen and NOT update the speed.

28.1.3.2 Engine Over RPM Pop-up

**Engine Speed
Over 2300 RPM**

This pop-up appears when the engine is going faster than recommended.

28.1.4 Other Driver Coaching Pop-ups

**Engine Warming Up
Please Wait**

This screen will be shown while the engine is too cold to be driven. When the engine temperature has increased, then this screen will go away. Revving or loading the engine while it is cold may reduce its useful life.

**Turn On
Engine Brake
to Increase
Service Brake Life**

This pop-up appears when service brakes are applied on an engine-brake-equipped vehicle, and the engine-brakes are currently not being used. The use of engine brakes reduces the amount of wear on the service brakes.


28.2 Driver Reward Pop-ups

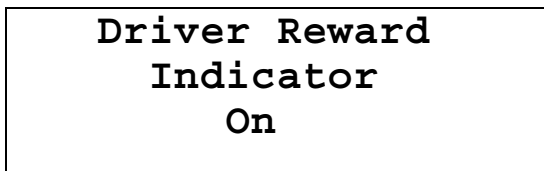
Driver Reward pop-ups tell the driver when a changed the Reward Level has been achieved.





28.2.1 Driver reward

The Driver Reward feature seeks to modify driver behavior by rewarding desirable habits (low percentage of idle time, high percentage of top gear time, high MPG, etc.). The rewards are in the form of an increase in the maximum allowable road speed.

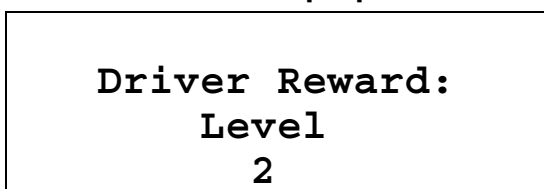
28.2.1.1 Turning Driver Reward Pop-up On or Off

Press . Select "Driver Reward".



Use the  or  to change between On and Off. Press  to save the selection. Press  to leave this screen and NOT update the choice.

28.2.1.2 Driver Reward Pop-up



This pop-up indicates that the reward level has changed. Level 1 is the highest reward level; 4 is the lowest reward level.

28.3 Aftertreatment Pop-ups

Aftertreatment pop-ups provide information to the driver in the event that the High Exhaust System Temperature (HEST) lamp or the Diesel Particulate Filter (DPF) lamp becomes active (illuminate). In addition, other informational aftertreatment pop-ups will be displayed if regeneration is halted due to certain vehicle conditions not being met.

These Pop-ups shall only be displayed on engines equipped with the Cummins EPA 2007 Aftertreatment System. In addition, the RoadRelay 4 must be connected to the J1939 vehicle

communications datalink. Refer to the RoadRelay 4 Installation Manual for further details on datalink wiring configurations. Refer to your Cummins Owners Manual for further information on the Cummins Aftertreatment system.

28.3.1 Active Regeneration

An active regeneration is signified by the illumination of the HEST lamp and the RoadRelay Active Regeneration in Progress pop-up. In this condition, high exhaust temperature may exist due to aftertreatment regeneration. Ensure that the exhaust pipe outlet is not directed at any surface or material that will melt, burn, or explode. Reference your Cummins Owners Manual for complete instructions.

28.3.1.1 Active Regeneration in Progress Pop-up

Active Regeneration	
In Progress	
DPF Temp	1123 F

The third line displays the current DPF Outlet temperature.

28.3.1.2 Active Regeneration Complete Pop-up

Regeneration
Complete

28.3.1.3 Active Regeneration Halted Pop-ups

**Active Regeneration
Halted Due To
Clutch**

This pop-up indicates that the Active Regeneration was halted due to the clutch being engaged.

**Active Regeneration
Halted Due To
Service Brake
Active**

This pop-up indicates that the Active Regeneration was halted due to the service brake being depressed.

**Active Regeneration
Halted Due To
PTO Active**

This pop-up indicates that the Active Regeneration was halted due to PTO being activated.

**Active Regeneration
Halted Due To
Accelerator Pedal
Off Idle**

This pop-up indicates that the Active Regeneration was halted due to the accelerator pedal being depressed.

<p>Active Regeneration Halted Due To Out of Neutral</p>
--

This pop-up indicates that the Active Regeneration was halted due to the vehicle not being in neutral.

28.3.2 Stationary Regeneration Due Notification

These pop-ups signify that your vehicle's aftertreatment system needs to perform a stationary (parked) regeneration. Refer to your vehicle's owners manual for further information on performing a stationary regeneration.

28.3.2.1 Stationary Regeneration Due Soon Pop-up

<p>Stationary Regeneration Due Soon!</p>

This pop-up signifies that the Aftertreatment Diesel Particulate Filter needs to be regenerated within the next 2-6 hours of operation. This can be accomplished by:

1. Changing to a more challenging duty cycle, such as highway driving, for at least 20 minutes
- Or
2. Performing a Stationary (Parked) regeneration.

28.3.2.2 Stationary Regeneration Due Immediately Soon Pop-up

**Stationary
Regeneration
Due Immediately!**

This pop-up signifies that the Aftertreatment Diesel Particulate Filter needs to be regenerated within the next 1-2 hours. In addition, engine power may be reduced automatically.

Regeneration can be accomplished by:

1. Changing to a more challenging duty cycle, such as highway driving, for at least 20 minutes

Or

2. Performing a Stationary (Parked) regeneration.

28.4 Cruise Set-Speed Pop-ups

When the cruise control set-speed is changed the following screen will be shown:

**Cruise Set Speed
72 mph**

28.5 Other Pop-ups

28.5.1 Memory Usage Pop-ups

**Fuel Records
Memory
Almost Full
Extract Soon**

**Route Memory
Almost Full
Extract Soon**

These screens indicate that RoadRelay 4 information storage for the indicated feature is 90 %, or more, full. This is a warning that data needs to be removed soon or it may be lost.

**Fuel Records
Memory Full
Data Lost**

**Route
Memory Full
Data Lost**

These screens indicate that RoadRelay 4 information storage for the indicated feature is full and some data has been lost.

28.5.2 RoadRelay

**RoadRelay
Failure**

This screen indicates a defect in the RoadRelay 4. Return the unit for repair.

28.5.3 Data Link

RoadRelay Data Link Failure

This screen indicates that no data has been received by the RoadRelay 4, during the last 30 seconds, from the engine. This failure indicates something is wrong with the engine electronics, wiring to the RoadRelay 4, or possibly the RoadRelay 4 itself. Check that all wires are attached correctly and that the engine electronics have power.

Improper Data Link Connection

This screen indicates a problem with the connection between the RoadRelay 4 and the engine. This failure indicates something is wrong with the engine electronics, wiring to the RoadRelay 4, or possibly the RoadRelay 4 itself. Check that all wires are attached correctly.

28.5.4 Backup Power Connection

No Power From Backup Battery

If this pop-up occurs the backup battery, inside the RoadRelay 4 (and not replaceable), is not connected or is dead. Check that all wires are properly connected to the RoadRelay 4. All data is lost when this error occurs.

28.5.5 RoadRelay Loss of Power

**RoadRelay
Loss of Power
Set RoadRelay Clock**

The RoadRelay 4 will display the following fault pop-up if the RoadRelay clock has not been set after the initial installation. Time/date stamping of data is very important for RoadRelay data integrity. This pop-up is intended as a reminder for the user to set the clock and NOT that the RoadRelay has malfunctioned or has been improperly installed.

.

29 Printing to HyperTerminal

HyperTerminal is a program included with the Windows™ operating system. It is a communications program, and by using it you may connect the RoadRelay 4 to the PC and create electronic copies of printed reports.

To connect the RoadRelay 4 to a PC, you will need a RoadRelay extraction harness (Cummins part number 4003775) and a serial cable to connect to your PC (You'll need to get this on your own – the Cummins cable has a female, 9-pin DB connector).

To launch HyperTerminal:

1. Select
Start|Programs|Accessories|Hyperterminal|HyperTerminal.
2. The program will ask for a name – enter the desired file name.
3. You will then be asked for a serial port to which to connect.
Choose the desired port.
4. Set the port settings as follows: 9600 Bits per second, 8 Data bits, Parity None, Stop bits 1, and Flow control None.

After connecting the cables and starting HyperTerminal you may copy data from the RoadRelay 4 to your PC. The output will appear in the HyperTerminal window. The file may be saved by doing File|Save As and selecting a name such as RR4data.txt.

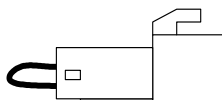
30 Environmental Information

The RoadRelay 4 is designed to operate within a temperature range of -40° to 185° F (-40° - 85° C).

It will operate from a voltage supply of 9.5 to 40 volts.

31 Disconnecting Power for Extended Periods

In situations where primary power (vehicle battery) will be disconnected from the RoadRelay 4, the backup battery should also be disconnected. This can be done by removing the loop-back connector from the RoadRelay 4. It is the large, white connector with 10 pins. Failure to remove the connector may result in a dead backup battery. Some data will be lost when the connector is removed.



Loop-Back Connector

32 Cleaning the RoadRelay 4

Do NOT use petroleum-based solvents or cleaners. Do NOT use abrasive cleansers or materials on the faceplate - they may cause scratches. Most standard household cleaners are suitable for use on the RoadRelay 4.

33 Troubleshooting and Technical Support

Related sections: Software Version; Fault Information

Always check all wiring to the RoadRelay 4 if you are having problems. Do not open the RoadRelay 4, doing so will void any

warranty you may have. The RoadRelay 4 has no user-serviceable parts.

If you believe the unit is properly wired and still not working call Technical Support. They may be reached at:

- 1-800-433-9341 in The USA
- 0800-286646 in the United Kingdom
- +1-812-3778136 for international calls

To make your call go as smoothly as possible, please have the following information handy when you call:

- Make and model of the vehicle in which the RoadRelay 4 is installed
- Engine Type (for example, 2007 Cummins ISX)
- Software Version of your RoadRelay 4 (refer to Software Version section of this manual)
- Transmission Type
- Any electronic systems on the vehicle (for example ABS)

34 Calibration Updates

The RoadRelay 4 is software upgradeable to support the latest features and updates. Visit us on the web at www.RoadRelay.com for details on the availability of new calibrations and other technical information.

35 Warranty

COVERAGE

Products Warranted

This warranty applies to New RoadRelay 4's™, sold by Cummins Inc. (hereinafter 'Cummins') and delivered to the first user on or after October 23, 1998, anywhere in the world where Cummins-approved service is available*.

Base Warranty

The Base Warranty covers any failure of the Product that results, under normal use and service, from defects in material or workmanship (Warrantable Failure). This Coverage begins with the sale of the Product by Cummins and ends 1 (one) year from the date of delivery of the Product to the first user.

Consumer Products

This warranty on Consumer Products in the United States is a **LIMITED** warranty. **CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Any implied warranties applicable to Consumer Products in the United States terminate concurrently with the expiration of the express warranties applicable to such products. In the United States, some states do **not** allow the exclusion of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the limitations or exclusions herein may **not** apply to you.

This warranty is made to the first Owner in the chain of distribution, and Coverage continues until the end of the period of coverage.

CUMMINS RESPONSIBILITIES

During the Base Warranty

Cummins will pay for all parts and labor needed to repair the damage to the Products resulting from a Warrantable Failure.

Cummins will pay for the Products including, but **not** limited to: Associated harnesses and installation materials and RoadRelay™ that are **not** reusable due to the Warrantable Failure.

In the event the engine does **not** start because of a malfunction of the Cummins Antitheft feature anytime during the warranty period, Cummins will repair or replace the feature when the truck is brought to an authorized Cummins Repair Facility or a mechanic, authorized by Cummins, visits the vehicle. This is Cummins sole obligation and your sole remedy.

OWNER RESPONSIBILITIES

During the Base Warranty

Owner **must** deliver the Products to the repair location.

Owner is responsible for the cost of the Products provided during warranty repairs unless such items are **not** reusable due to the Warrantable Failure.

At the time when the parts are installed, Owner is responsible for the preparation of a written record containing the following: (1) The date of installation of the

Product(s); (2) the Engine serial number; (3) the Engine miles, kilometers, or hours of operation; (4) the Product(s) installed; and (5) the location of the Product(s) in the application. The purpose of this record is to protect Owner's interests and support any claim for a Warrantable Failure. Owner is responsible for the operation and maintenance of the Products as specified in the applicable User's Guide. Owner is also responsible for providing proof that all recommended maintenance has been performed. Before the expiration of the warranty, Owner **must** notify a Cummins Distributor, Authorized Dealer, or other repair location* approved by Cummins of any Warrantable Failure, and deliver the Products to such facility for repair.

Owner is responsible for communication expenses, meals, lodging, and similar costs incurred as a result of a Warrantable Failure.

Owner is responsible for non-Product repairs and for "downtime" expenses, passenger delays, cargo damage, fines, all applicable taxes, all business costs, and other losses resulting from a Warrantable Failure.

Owner is responsible for Antitheft Feature repairs due to incorrect passwords, including lack of RoadRelay™ display caused by use of the RoadRelay™ outside of specified operating temperatures.

LIMITATIONS

Cummins is **not** responsible for radio frequency interference. Cummins is **not** responsible for failures or damage resulting from what Cummins determines to be abuse, neglect, including, but **not** limited to:

incorrect operation and maintenance as stated in the appropriate user's guide and installation guide, use of cleaners other than a moist cloth to clean RoadRelay™ keypads, displays, and enclosures.

This warranty does **not** apply to Products that bear the name of another company.

The Product(s) and parts used to repair a Warrantable Failure may be new Cummins parts, Cummins-approved rebuilt parts, or repaired parts. Cummins is **not** responsible for failures resulting from the use of parts **not** approved by Cummins.

A new Cummins or Cummins-approved rebuilt part used to repair a Warrantable Failure assumes the identity of the part it replaced and is entitled to the remaining coverage hereunder.

For warranty purposes, parts used in a warrantable repair assume the identity of the parts they replace.

CUMMINS DOES NOT COVER WEAR OR WEAROUT OF COVERED PARTS.

CUMMINS IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

CUMMINS INC MAKES NO OTHER REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

UNDER NO CIRCUMSTANCES WILL CUMMINS ENGINE COMPANY

BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, INCLUDING WITHOUT LIMITATION LOST PROFITS OR INCOME, DAMAGE TO FREIGHT, AND LIVING OR TRAVEL EXPENSES, IN THE EVENT OF THEFT, OR IF THE ANTITHEFT FEATURE PREVENTS THE ENGINE FROM STARTING FOR ANY REASON, INCLUDING CUMMINS OWN NEGLIGENCE.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

In case of consumer sales, in some countries the Owner has statutory rights that cannot be affected or limited by the terms of this warranty.

Nothing in this warranty excludes or restricts any contractual rights the Owner may have against third parties.

* Locations in the United States and Canada are listed in the Cummins United States and Canada Sales and Service Directory; other locations are listed in the Cummins International Sales and Service Directory.

This image shows a full page of blank handwriting practice paper. It features approximately 28 evenly spaced, thin grey horizontal lines extending across the entire width of the page. The background is a solid off-white color, providing a clean surface for writing practice. There are no margins, text, or other markings present.

[illegible]



Technical Support

1-800-433-9341

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